

PATENT

Atty. Dkt. No. NVDA/P000723

REMARKS

This is intended as a full and complete response to the Final Office Action dated April 10, 2006 having a shortened statutory period for response set to expire on July 10, 2006. Please reconsider the claims pending in the application for reasons discussed below.

Claims 1-10, 17, and 18 remain pending in the application after entry of this response. Claim 1 has been amended. No new matter has been added by the amendments.

Claims 1, 3-7, 9, 17, and 18 are rejected under 35 USC §103(a) as being obvious in view of Hornq (U.S. Pat. No. 6,697,256) and Inoue (U.S. Pat. No. 6,311,767) or Michael (U.S. Pat. No. 6,778,390). Claim 2 is rejected under 35 USC §103(a) as being obvious in view of Hornq, Inoue, and Kitajo (U.S. Pat. No. 5,838,066). Claims 8 and 10 are rejected under 35 USC §103(a) as being obvious over Hornq and Inoue. Reconsideration of the claims is requested for reasons presented below.

Claim Rejections – 35 USC §103

Claims 1, 3-7, 9, 17, and 18 are rejected under 35 USC §103(a) as being obvious in view of Hornq and Inoue or Michael.

Regarding motivation to combine, both Inoue and Michael teach away from the limitation recited in claim 1 of a heat sink lid covering only a portion of the air channels proximate the fan. Specifically, Inoue and Michael both teach cooling systems having improved cooling efficiency; whereas the present invention arguably makes a tradeoff between cooling efficiency and noise reduction.

Inoue requires improved cooling efficiency so that his cooling system may adequately cool a CPU in the confines of a laptop. Michael requires improved cooling efficiency so that his cooling system may adequately cool a high-power graphics card in the confines of an AGP slot. In sharp contrast, the heat sink lid as recited in claim 1 is specially configured to reduce noise by eliminating the reflective surface that would otherwise intensify sound waves propagating through the air channels. However, reducing the size of the heat sink lid to cover only a portion of the air channels while

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reducing noise, arguably also reduces the cooling efficiency of the system disclosed in the present application. The references cited by the Examiner support this point. For example, Michael explains the benefit of a lid covering the air channels as follows:

Top 311 improves air flow specifically over heat sinks 305 and 307 by restricting the flow to remain near card 101, especially near the memory chips 121. As noted previously, the presence of the chips protruding from card 101 disturbs the flow. It has been found by the inventor of this invention that in some cases the flow separates from card 101 or recirculates, locally decreasing the heat transfer and resulting in a global variation in heat transfer, for example from chip to chip. Top 311 forces the flow to remain near chips 121 and inhibits the formation of recirculating flow. The result is improved uniformity and heat transfer predictability.

(Col. 8, lines 35-47, emphasis added). In short, the invention recited in the pending claims is an optimized design that recognizes the tradeoff between noise reduction and cooling efficiency. None of the cited references contemplates the problem of noise reduction, and certainly none addresses or recognizes the tradeoff made by the present invention. Since the teachings and goals of both Inoue and Michael point to ways to increase cooling efficiency, these references teach away from the design choice made by the present invention. Thus, these references cannot be used to render the pending claims obvious.

In addition, when viewing either of these references in light of Hornig, it is difficult to arrive at the present invention. Hornig teaches an improved fastener for attaching a lid and a fan- sink to a motherboard. Hornig teaches no improvement in operation of the cooling system. The end benefit is a less expensive manufacturing process. There is little in common between Hornig and either Inoue or Michael. The Examiner cites reduction of air pressure at the end of the channel and multi-directional dissipation of heat as a motivation to combine the references. Respectfully, Applicants believe that air pressure reduction and multi-directional heat dissipation will lead to a less efficient cooling system rather than a more efficient system. For example, in distinguishing a prior art system, Michael again, states:

This flow pattern has several adverse consequences, including having only a portion of the flow available to cool memory chips 121, providing uneven cooling between chips or along heat sink 123, and the possibility of allowing for flow separation or recirculation near the chips.

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(Col. 3, lines 19-24). Thus, the combination suggested by the Examiner, for the reasons proffered by the Examiner, would produce a less efficient cooling system, something that is in direct contravention with the teachings of both Inoue and Michael.

For the foregoing reasons, Applicants submit the combination of Hornq with Inoue or Michael is improper. Withdrawal of the rejection is respectfully requested.

Claim 2 is rejected under 35 USC §103(a) as being obvious over Hornq in view of Inoue and Kitaio. Kitaio adds nothing that would cure the deficiencies of any of Hornq and Inoue, discussed above. Withdrawal of the rejection is respectfully requested.

Claims 8, 10, and 21 are rejected under 35 USC §103(a) as being obvious over Hornq and Inoue. As discussed above, the combination of Hornq with Inoue is improper. Withdrawal of the rejection is respectfully requested.

Conclusion

In conclusion, the references cited by the Examiner, alone or in combination, do not teach, show, or suggest the invention as now claimed. Having addressed all issues set out in the office action, Applicant respectfully submits that the claims are in condition for allowance and respectfully request that the claims be allowed.

Respectfully submitted,



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